



Drinking water salinity and maternal health in coastal Bangladesh: Implications of climate change

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Abstract:

BACKGROUND: Drinking water from natural sources in coastal Bangladesh has become contaminated by varying degrees of salinity due to saltwater intrusion from rising sea levels, cyclone and storm surges, and upstream withdrawal of freshwater. **OBJECTIVE:** Our objective was to estimate salt intake from drinking water sources and examine environmental factors that may explain a seasonal excess of hypertension in pregnancy. **METHODS:** Water salinity data (1998-2000) for Dacope, in rural coastal Bangladesh, were obtained from the Centre for Environment and Geographic Information System in Bangladesh. Information on drinking water sources, 24-hr urine samples, and blood pressure was obtained from 343 pregnant Dacope women during the dry season (October 2009 through March 2010). The hospital-based prevalence of hypertension in pregnancy was determined for 969 pregnant women (July 2008 through March 2010). **RESULTS:** Average estimated sodium intakes from drinking water ranged from 5 to 16 g/day in the dry season, compared with 0.6-1.2 g/day in the rainy season. Average daily sodium excretion in urine was 3.4 g/day (range, 0.4-7.7 g/day). Women who drank shallow tube-well water were more likely to have urine sodium > 100 mmol/day than women who drank rainwater [odds ratio (OR) Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 2.05; 95% confidence interval (CI), 1.11-3.80]. The annual hospital prevalence of hypertension in pregnancy was higher in the dry season (OR Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 12.2%; 95% CI, 9.5-14.8) than in the rainy season (OR Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 5.1%; 95% CI, 2.91-7.26). **CONCLUSIONS:** The estimated salt intake from drinking water in this population exceeded recommended limits. The problem of saline intrusion into drinking water has multiple causes and is likely to be exacerbated by climate change-induced sea-level rise.

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Resource Description

Exposure : ☐

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Food/Water Quality, Food/Water Security, Sea Level Rise

Extreme Weather Event: Hurricanes/Cyclones

Food/Water Quality: Other Water Quality Issue

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Water Quality (other): Salinity

Geographic Feature: 

resource focuses on specific type of geography

Ocean/Coastal, Rural

Geographic Location: 

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Bangladesh

Health Impact: 

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Developmental Effect

Cardiovascular Effect: Other Cardiovascular Effect

Cardiovascular Disease (other): Hypertension

Developmental Effect: Reproductive

Mitigation/Adaptation: 

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: 

populations at particular risk or vulnerability to climate change impacts

Children, Pregnant Women

Resource Type: 

format or standard characteristic of resource

Research Article

Timescale: 

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: 

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

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